CLAIM AMENDMENTS

1-33 (canceled)

34. (new) A device for fuel injection rate shaping, the device having first and second ends and comprising:

a body defining an interior space, a first channel at the first end of the device for fuel primarily entering the device and a second channel at the second end of the device for fuel primarily leaving the device, the first and second channels being in communication with the interior space of the body, and

a piston movably disposed in the interior space of the body and dividing the interior space into a first main chamber and a second main chamber having respective volumes that depend upon the position of the piston, whereby fuel entering the device through the first channel enters the first main chamber,

and wherein the device defines at least one auxiliary chamber,

initial movement of the piston in a first direction unites the auxiliary chamber with the first main chamber, whereby the auxiliary chamber is filled with fuel from the first main chamber,

subsequent movement of the piston in a second direction results in increase in pressure in the auxiliary chamber,

and further movement of the piston in the second direction establishes a connection between the auxiliary chamber and the second main chamber, permitting a fuel flow from the auxiliary chamber to the second main chamber and speeding up movement of the piston in the second direction.

35. (new) A device according to claim 34, comprising a resilient means located in the second chamber to bias the piston toward the first end of the device, and wherein the piston has outer edges that are machined so that they form a support for the resilient means.

36. (new) A device according to claim 34, comprising a resilient means located in the second chamber to bias the piston

toward the first end of the device, and wherein the body is provided with support structures for the resilient means.

37. (new) A device for fuel injection rate shaping, the device having first and second ends and comprising:

a body defining an interior space, a first channel at the first end of the device for fuel primarily entering the device and a second channel at the second end of the device for fuel primarily leaving the device, the first and second channels being in communication with the interior space of the body, and

a first piston movably disposed in the interior space of the body and dividing the interior space into a first main chamber and a second main chamber having respective volumes that depend upon the position of the first piston, whereby fuel entering the device through the first channel enters the first main chamber, the first piston having an outer wall defining a recess and also having a middle section formed with a passage, and the recess of the first piston being open toward the first end of the device,

a first resilient means located in the second chamber to bias the first piston toward the first end of the device,

a channel construction arranged so that one end thereof is supported by the second end of the device and another end is located in the passage of the first piston, whereby the first piston is slidable with respect to the channel construction,

a second piston located in the recess of the first piston and slidable with respect to the first piston, the second piston being formed with a passage, and

a second resilient means to bias the second piston toward said channel construction,

and wherein the device defines at least one auxiliary chamber,

initial movement of the first piston in a first direction unites the auxiliary chamber with the first main chamber, whereby the auxiliary chamber is filled with fuel from the first main chamber,

subsequent movement of the first piston in a second direction, opposite said first direction, results in increase in pressure in the auxiliary chamber,

and further movement of the first piston in the second direction establishes a connection between the auxiliary chamber and the second main chamber, permitting fuel flow from the auxiliary chamber to the second main chamber and speeding up movement of the piston in the second direction.

38. (new) A device according to claim 37, wherein the second piston has an outer wall defining a recess and also has a middle section formed with a passage, and the recess of the second piston is open toward the first end of the device.

39. (new) A device according to claim 37, wherein the channel construction is formed with an interior channel and with at least one passage connecting the interior channel to the second main chamber.

40. (new) A device according to claim 39, wherein the passage of the second piston is in direct communication with the interior channel of the channel construction, the second resilient means biases the second piston against the channel construction, and the interior channel of the channel construction is in communication with the second channel.

41. (new) A device according to claim 40, wherein the passage of the second piston is a choke channel.

42. (new) A device according to claim 40, wherein the second piston has an outer side that confronts an inner side of the first piston, and the auxiliary chamber is formed by a chamfer or groove at the outer side of the second piston, whereby the auxiliary chamber is defined between the outer side of the first piston and the inner side of the second piston.

43. (new) A device according to claim 38, wherein the position and motion of the first and second pistons are dependent upon pressure conditions prevailing within the device such that when the second main chamber is at a sufficiently low pressure relative to that prevailing within the first channel, the first piston moves in the first direction and the motion of the first piston increases the volume of the first chamber,

and when the second chamber is at a sufficiently high pressure relative to that prevailing within the first channel, the first piston moves in the second direction, assisted by the first resilient means, and the motion of the first piston decreases the respective volumes of the auxiliary chamber and the first main chamber and at a certain point of the piston motion the connection between the first main chamber and the auxiliary chamber is broken and pressure in the auxiliary chamber urges the second piston in the second direction, separating the second piston from the channel construction, whereby a connection between the auxiliary chamber and the interior channel of the channel construction is established,

and when the pressure in the auxiliary chamber falls, the second resilient means moves the second piston toward the channel construction, breaking the connection between the auxiliary chamber and the interior channel of the channel construction.

44. (new) A device according to claim 42, wherein the position and motion of the first and second pistons are dependent upon pressure conditions prevailing within the device such that when the second chamber is at a sufficiently low pressure relative to that in the first channel, the first piston moves in the first direction and the motion of the first piston increases the volume of the first chamber,

and when the second chamber is at a sufficiently high pressure relative to that prevailing within the first channel, the first piston moves in the second direction, assisted by the first resilient means, which motion decreases the respective volumes of

the auxiliary chamber and the first volume and at a certain point of the piston motion the communication between the first chamber and the auxiliary chamber is broken and pressure in the auxiliary chamber urges the second piston in the second direction, separating the second piston from the channel construction, whereby a connection between the auxiliary chamber and the interior channel of the channel construction is established,

and when the pressure in the auxiliary chamber falls, the second resilient means urges the second piston toward the channel construction, breaking the connection between the auxiliary chamber and the interior channel of the channel construction.

45. (new) A device according to claim 37, wherein the passage or passages in the channel construction are located so that the communication between the first channel and the second channel is broken when the first piston is at the second end of the device, whereby the device blocks flow between the first and second channels.

46. (new) A device according to claim 37, wherein the second piston is provided with support structures for the second resilient means.

46. (new) A device according to claim 46, wherein the first and second resilient means are first and second springs respectively.

48. (new) A method of operating a device for fuel injection rate shaping, wherein the device comprises body that defines a space and a movable piston arranged in the space and dividing the space into first and second main chambers, the volumes of which depend upon the position of the piston, and at least one auxiliary chamber, which can be united with the main chambers, the method comprising:

supplying fuel under pressure to the first main chamber, whereby the piston moves in a first direction, towards the second end of the device,

utilizing the piston motion in the first direction to fill the auxiliary chamber with fuel from the first main chamber,

subsequently permitting the piston to move in a second direction, whereby pressure in the auxiliary chamber increases, and

establishing a connection between the auxiliary chamber and the second main chamber, permitting fuel flow from the auxiliary chamber to the second main chamber and thereby speeding up movement of the piston in the second direction.

49. (new) A method according to claim 48, comprising utilizing the piston motion in the first direction to establish a connection between the auxiliary chamber and the first main chamber, whereby the auxiliary chamber is filled with fuel from the first main chamber.

50. (new) A method according to claim 49, wherein the connection between the auxiliary chamber and the first main chamber is established when the piston starts moving in the first direction.

51. (new) A method according to claim 48, comprising utilizing the piston motion in the second direction to establish the connection between the auxiliary chamber and the second main chamber at a certain point of the piston motion.